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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,262	03/03/2005	Takashi Maeda	2005_0059A	8304

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EXAMINER	
HESS, MICHAEL THOMAS	
ART UNIT	PAPER NUMBER
3709	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/523,262	MAEDA ET AL.	
	Examiner	Art Unit	
	Michael T. Hess	3709	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) *7-29* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 January 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/27/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I in the reply filed on February 21, 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 7-29 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group, there being no allowable generic or linking claim.

Drawings

3. The drawings are objected to because the word "Acieved" in Step #6 on Fig. 5 is misspelled and should be changed to "Achieved." Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement

sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The abstract of the disclosure is objected to because it contains 208 words and 37 C.F.R. § 1.72(b) limits the length of the abstract to 150 words. Correction is required. See MPEP § 608.01(b).

5. The disclosure is objected to because of the following informalities: ***

- The word "of" should be inserted on Page 3, Lines 18-19 between "variety types";
- The word component on Page 3, Line 19 should be "components";
- The phrase "Major issue" on Page 3, Line 19 should be "A major issue";
- The word "found" on Page 7, Line 8 should be "find";
- The phrase "be not" on Page 8, Line 22 should be "not be";
- The word "make" on Page 10, Line 17 should be "makes";
- The word "no" on Page 11, Line 9 should be "not";
- The word "having" on Page 15, line 18 should be deleted;
- The word "with" on Page 16, Line 20 should be deleted;
- The word "holding" on Page 25, Line 2 should be deleted;

- The word "at" on Page 27, Line 23 should be "as";
- The reference numbers for "sucking system T1" and "blowing system T2" on Page 31, Lines 17 and 18 should be switched to match their labeling on Figure 3;
- "Sucking system T1" and "blowing system T1" on Page 31, Lines 22 and 24 have the same reference numeral;
- The terms "is not" and "component" on Page 36, Line 11 should be switched;
- The word "patters" on Page 48, Line 11 should be "patterns";
- The word "become" on Page 49, Line 1 should be becomes;
- The word "takes" on Page 53, Line 16 should be "take";
- The word "timing" on Page 59, Line 16 should be "time";
- The phrase "be identified" on Page 59, line 28 should be "identify"
- The word "Event" on Page 60, Line 1 should be "Even."

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01.

<u>In Reference to Claim 4</u>

The method according to claim 3, further comprising steps of:

after identifying the nozzle that has failed to pick up a component based on the obtained images shutting a vacuum air passage of that identified nozzle;

imaging the identified nozzle one more time, and detecting whether or not a component is still carried by the nozzle.

The first step of the method claimed in claim 4 above requires the identifying of the nozzle that has failed to pick up a component; however, the second step of the method claimed in claim 4 above requires the imaging of the nozzle one more time and detecting whether or not a component is ***still*** carried by the nozzle. Because the first step requires identifying a nozzle without a component it is unclear which nozzle applicant is discussing that is to be identified by an image for the purpose of detecting whether or not a component is still on the nozzle. Thus, there is a gap between necessary structural connections and the examiner cannot appropriately apply prior art to claim 4; and therefore, applicant should not view the lack of a prior art rejection with regards to claim 4 as an indication of allowable subject matter.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,632,065 to Cameron et al. (Cameron) in view of U.S. Patent No. 6,454,511 to Jordan et al. (Jordan).

In Reference to Claim 1

Cameron teaches:

A method of component mounting for picking up components and mounting the same onto respective predetermined mounting positions of a circuit substrate by means of a plurality of nozzles connected to a single vacuum generating source, wherein the method including procedures for preventing occurrence of defective circuit substrates due to missing component, said procedures comprising the steps of:

detecting vacuum pressure decrease of the nozzle (Ref. # 116) from the initialized zero value (Col. 6, Lines 17-20; the vacuum sensor identifies the vacuum pressure state and reports the information) and

if the detected vacuum pressure decrease exceeds predetermined first threshold, making a judgment that the nozzle has failed to pick up a component (Col. 6, Lines 21-24; "if a substrate is not positioned on a paddle, the vacuum sensor for the paddle measures a pressure level above a predetermined vacuum threshold"), and skipping component mounting operation by that particular nozzle (Col. 6, Lines 25-28; the vacuum signal interpreter generates a shot-valve signal to close the vacuum valve associated with the nozzle).

However, Cameron fails to teach:

initializing achieved vacuum pressure of a nozzle after completion of component pick up operation to zero.

Jordan teaches:

initializing achieved vacuum pressure of a nozzle after completion of component pick up operation (Col. 6, Lines 23-34; the controller is initialized to calibrate and the initialization includes reading and storing the pressures sensed during the suction of a load) to zero in order to calibrate the vacuum pressure and improve the accuracy of measurement by compensating for variations in pressure readings of the sensor (see Col. 6, Lines 14-16).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have added the step of initializing the achieved vacuum pressure taught in Jordan to the method of picking up components taught by Cameron in order to increase the accuracy of pressure detections by compensating for variations in pressure readings of the sensor as implicitly taught by Jordan.

10. Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patent No. 6,632,065 to Cameron et al. (Cameron) in view of U.S. Patent No. 6,454,511 to Jordan et al. (Jordan) as applied to claim 1 above, and further in view of U.S. Patent No. 4,683,654 to Scholten et al. (Scholten).

In Reference to Claims 2 and 5

Cameron and Jordan teach:

The method according to claim 1 (see 35 U.S.C. § 103 rejection of claim 1 above), further comprising steps of:

However, Cameron and Jordan fail to teach:

before initializing the achieved vacuum pressure of a nozzle to zero, detecting absolute value of the vacuum pressure achieved by the nozzle after completion of component pick up operation, and

if the detected achieved vacuum pressure is lower than predetermined second threshold, shutting a vacuum air passage of that particular nozzle.

Scholten teaches:

before initializing the achieved vacuum pressure of a nozzle to zero, detecting absolute value of the vacuum pressure achieved by the nozzle after completion of component pick up operation (Col. 9, Lines 52-54, a first pressure detection occurs immediately after picking up the component; see Col. 5, Lines 41-50, shows how the sensor works), and

if the detected achieved vacuum pressure is lower than predetermined second threshold (Col. 9, Lines 54-59, detection of failure of component pick-up; see Col. 5, Lines 41-50), shutting a vacuum air passage of that particular nozzle (Col. 10, Lines 4-5) in order to skip the mounting operation of the nozzle without a component and to check the device.

Scholten also teaches:

the method according to claim 2, wherein the nozzles perform component mounting operations, excluding the nozzle that is judged to have failed to pick up a component and the nozzle whose vacuum air passage is shut (Col. 10, Lines 15-18, the

empty pipette does not perform placement operation, but the pipettes with components accurately perform placement operation).

It would have been obvious for one having ordinary skill in the art at the time the invention was made to have further included the steps of detecting the absolute value of the vacuum pressure achieved by the nozzle after completion of component pick up operation, prior to initialization, and shutting a vacuum air passage of that particular nozzle if the detected achieved vacuum pressure is lower than predetermined second threshold of Scholten in the component pick up method of Cameron and Jordan in order to skip the mounting operation of nozzle that fails to pick-up a component as implicitly taught by Scholten.

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Patent No. 6,632,065 to Cameron et al. (Cameron) in view of U.S. Patent No. 6,454,511 to Jordan et al. (Jordan) as applied to claim 1 above, further in view of U.S. Patent No. 4,683,654 to Scholten et al. (Scholten) as applied to claim 2 above and further in view of U.S. Patent No. 7,065,864 to Yamamoto et al. (Yamamoto).

In Reference to Claim 3

Cameron, Jordan and Scholten teach:

The method according to Claim 2 (see 35 U.S.C. § 103 rejection of claim 2 above), further comprising steps of:

However, Cameron, Jordan and Scholten fail to teach:

imaging each of the nozzles with a recognition camera; and

identifying which nozzle has failed to pick up a component based on the obtained images.

Yamamoto teaches:

imaging each of the nozzles with a recognition camera (Ref. # 207, Col. 14, Lines 21-24); and

identifying which nozzle has failed to pick up a component based on the obtained images (Col. 14, Lines 42-46) in order to visually determine which nozzle failed to pick up a component, so component mounting step can be skipped (Col. 14, Lines 42-46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have included the steps of imaging the nozzles and determining which nozzle failed to pick up a component as taught by Yamamoto in the component pick up method taught by Cameron, Jordan and Scholten in order to skip the component mounting step when a component has not been picked up as explicitly taught by Yamamoto.

12. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,683,654 to Scholten et al. (Scholten) in view of U.S. Patent No. 6,632,065 to Cameron et al. (Cameron).

In Reference to Claim 6

Scholten teaches:

Component mounting apparatus (see Fig. 1) comprising:

a vacuum generating source (Fig. 1, Ref. # 109);

a plurality of nozzles connected to said vacuum generating source (Col. 7, Lines 22-23, "thirty-two transfer arms..."),

a mounting head being supported in a movable manner and holding said plurality of nozzles (Ref. # 31, common carriage, which is slidable in the frame Ref. 23; Col. 7, Lines 26-28);

a component recognition device (Col. 1, Lines 49-54; Scholten states that it is known in the art to use optical detection methods in combination with pressure detectors to determine if pick up has properly occurred) positioned to face with the mounting head for recognizing components held by the nozzle;

a controller (Ref. # 127) for controlling operations of the component mounting apparatus in accordance with a method according to any one of the preceding claims (Cols. 9-10, Lines 59-5).

Although Scholten only discloses the use of a recognition device in its background of invention section, it would have been obvious to one having ordinary skill in the art to include a camera as a failsafe check to determine if component pick up occurred.

However, Scholten fails to show :

a control valve for each nozzle capable of shutting a vacuum air passage;

Cameron teaches:

a control valve for each nozzle (Ref. # 144) capable of shutting a vacuum air passage (Col. 6, Lines 25-28, closure of a vacuum control valve) in order to prevent leaks (Col. 6, Line 33).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have included the control valve for each nozzle of Cameron in the component mounting apparatus of Scholten in order to limit vacuum loss when not all nozzles complete component pick-up as explicitly taught by Cameron.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- U.S. Patent Nos. 6,979,032 to Damhuis, 5,207,467 to Smith, 5,961,168 to Kanno, 7,174,773 to Borzabadi et al. and 6,531,094 to Seto et al. are relevant prior art because they discuss fluid pressure sensing systems for component grasping.
- U.S. Patent Nos. 6,779,259 to Mimura et al., 6,868,603 to Okuda et al. and 6,974,168 to Capewell are relevant prior art because they discuss using recognition means to determine success of component pick-up.
- EP 000036826 A1 is relevant prior art because it discloses using both a pressure and optical detecting means for determining success of component pick-up.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael T. Hess whose telephone number is 571-270-1994. The examiner can normally be reached on 6:30 AM - 5:00 PM, Monday - Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Bomberg can be reached on 571-272-4922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MTH/MTH 4.5.07

THAO X. LE
PRIMARY PATENT EXAMINER